

- Sub 8/22
a4
canal
16. (Amended) The modulator of Claim 15 further comprising a first layer of dielectric material underneath the electro-optic material and a second layer of dielectric material above the electro-optic material.

- Sub 8/23
AS
18. (Amended) The modulator of Claim 15 wherein the first and second electrodes comprise an optically transmissive conductive material.

19. (Amended) The modulator of Claim 15 further comprising a copper interconnect extending from each pixel mesa along a mesa sidewall to a circuit contact of a pixel circuit.

REMARKS

Claims 1-40 are pending in the application. Claim 15 is cancelled. A provisional election has been made without traverse to prosecute the invention of Group I, Claims 1-19, during a telephone conversation between the Examiner and David Thibodeau on October 10, 2001. Claims 20-40 are withdrawn from further consideration by the Examiner under 37 C.F.R. 1.142(b) as being drawn to a non-elected invention.

Claims 1-4, 6-12, and 18 are rejected under 35 U.S.C. §103(a) as being unpatentable over Gobeli (U.S. Pat. 5,768,003), Robinson *et al.* (U.S. Pat. 6,091,463), Birnbach (U.S. Pat. 4,786,128), and Bowman *et al.* (U.S. Pat. 5,637,883). Claims 5, 13-17, and 19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form to include all the limitations of the base claim and any intervening claims. No new matter is introduced.

Claim 15 has been rewritten in independent form and now includes all the limitation of Claim 1; Claim 1 has been cancelled. Thus, amended Claim 15 should be allowable over Gobeli, Robinson *et al.*, Birnbach, and Bowman *et al.*, either alone or in combination, because these cited references do not teach "a first mirror underneath the electro-optic material and a second mirror above the electro-optic material," as stated in Part 14 of the Office Action at hand. All claims

depending from Claim 1 (Claims 2-11, 16, and 18-19) have been amended to depend from Claim 15.

Information Disclosure Statement

An information Disclosure Statement (IDS) is being filed concurrently herewith under 37 C.F.R. 1.97(c), with an appropriate fee, as set forth in 37 C.F.R. 1.97(p).

CONCLUSION

In view of the above amendments and remarks, it is believed that all claims (Claims 2-19) are in condition for allowance, and it is respectfully requested that the application be passed to issue. If the Examiner feels that a telephone conference would expedite prosecution of this case, the Examiner is invited to call the undersigned at (978) 341-0036.

Respectfully submitted,

HAMILTON, BROOK, SMITH & REYNOLDS, P.C.

By Mark B. Solomon
Mark B. Solomon
Registration No. 44, 348
Telephone: (978) 341-0036
Facsimile: (978) 341-0136

Concord, MA 01742-9133
Dated: 1/22/02

MARKED UP VERSION OF AMENDMENTSSpecification Amendments Under 37 C.F.R. § 1.121(b)(1)(iii)

Replace the paragraph at page 10, lines 4-13 with the below paragraph marked up by way of bracketing and underlining to show the changes relative to the previous version of the paragraph.

FIG. 4 illustrates an array of modulators 31 positioned adjacent corresponding RAM cells 32 on a silicon substrate 11. This envisions a standard RAM design with extra area between RAM cells for the modulator elements. There are two types of RAMs, dynamic (DRAMs) and static (SRAMs). When using a DRAM, the modulator element replaces the storage capacitor used for memory. DRAMS have the advantage of having smaller cell sizes so that the fill factor, the percentage of the chip area covered by modulator are is maximized. SRAM cells have flip-flops that have one output that toggles between a 0 and a 1 state, i.e., 0 volts and the chip supply voltage. In this case, the output is connected to one of the modulator contacts, e.g., [21] 20 in FIG. 1 with the other contact 19 grounded.

Claim Amendments Under 37 C.F.R. § 1.121(c)(1)(ii)

2. (Amended) The modulator of Claim [1] 15 wherein the solid state electro-optic material comprises a ceramic material.
3. (Amended) The modulator of Claim [1] 15 wherein the solid state electro-optic material comprises PLZT.
4. (Amended) The modulator of Claim [1] 15 wherein the pixel circuits comprise an array of transistors formed on a silicon substrate.
5. (Amended) The modulator of Claim [1] 15 wherein the electro-optic material comprises a thin film layer having a thickness of 2000 nm or less.

6. (Amended) The modulator of Claim [1] 15 wherein the electro-optic material comprises a plurality of layers.
7. (Amended) The modulator of Claim [1] 15 wherein each electrode comprises an electrically conductive layer that contacts a dielectric layer.
8. (Amended) The modulator of Claim [1] 15 wherein the semiconductor substrate comprises a CMOS integrated circuit.
9. (Amended) The modulator of Claim [1] 15 further comprising a light source and an optical coupler.
10. (Amended) The modulator of Claim [1] 15 further comprising a memory circuit co-located with each pixel.
11. (Amended) The modulator of Claim [1] 15 wherein each pixel circuit comprises a random access memory.
13. (Amended) The modulator of Claim 12 wherein the first layer comprises [PZT] PLZT.
15. (Amended) A spatial light modulator comprising: [The modulator of Claim 1 further comprising]
an array of pixels formed on a semiconductor substrate, each pixel including a solid state electro-optic material positioned between a first electrode and a second electrode;
a first mirror underneath [a first mirror underneath] the electro-optic material and a second mirror above the electro-optic material forming a cavity; and
an array of pixel circuits formed with the semiconductor substrate, each pixel being connected to a pixel circuit.

16. (Amended) The modulator of Claim [1] 15 further comprising a first layer of dielectric material underneath the electro-optic material and a second layer of dielectric material above the electro-optic material.
18. (Amended) The modulator of Claim [1] 15 wherein the first and second electrodes comprise an optically transmissive conductive material.
19. (Amended) The modulator of Claim [1] 15 further comprising a copper interconnect extending from each pixel mesa along a mesa sidewall to a circuit contact of a pixel circuit.